

# (12) UK Patent Application (19) GB (11) 2 182 337 (13) A

(43) Application published 13 May 1987

(21) Application No 8626054

(22) Date of filing 31 Oct 1986

(30) Priority data

(31) 793782

(32) 1 Nov 1985

(33) US

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(51) INT CL<sup>4</sup>

C08L 61/28 27/06

(52) Domestic classification (Edition I)

C3M 116 122 123 126 136 156 201 XAN

B2E 1703 436CT 436S 444T 450T 456T 460T 489CT 493T

622TM

U1S 1220 1592 3017 3035 3040 B2E C3M

(56) Documents cited

GB 1599100

GB 1280404

GB 1501243

US 4377457

GB 1496345

US 4288357

GB 1417502

US 4028300

GB 1302379

US 3919351

(58) Field of search

B2E

C3M

C3V

(54) Surface covering

(57) A coating for surface coverings, and in particular floor coverings, which comprise treated polyurethane or other wear layers, comprises a melamine aminoplast which preferably is at least partially etherified with alkyl groups comprising 4 to 10 carbon atoms, a vinyl modifier resin, a polyol, and an acid catalyst. It may be coated on a release surface and thermally cured. A crosslinkable wear layer composition may be cast on the cured layer and crosslinked, and the composite transferred to a support surface. Surface coverings are produced which exhibit surprising resistance to common household strains, and also improved scratch resistance.

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## SPECIFICATION

## Surface covering

5 The present invention relates to surface coverings, and more particularly to surface coverings which have improved scratch and stain resistance. 5

Resilient surface coverings, and in particular resilient floor coverings, are well known in the art. The floor coverings which are in wide use today are primarily of vinyl construction and, though they can be constructed to have varying degrees of flexibility, they are "resilient" when compared to conventional natural materials, 10 such as ceramic tile. A variety of such products is commercially available and these products have proved to exhibit good wear resistance; however, such coverings are not without certain deficiencies. For example, although vinyl flooring products have proved to be durable and stain resistant, they nevertheless tend to lose their glossy appearance through wear. A high-gloss appearance for a floor covering is often desired. Accordingly, the manufacturers of such materials have long sought to find improved floor coverings which exhibit 15 good gloss retention. 15

One method of providing improved gloss retention is through the application of polyurethane or other wear layers to vinyl flooring structures. Such materials are durable and relatively scratch resistant, and they tend to retain their high-gloss appearance over a longer period of time than do vinyl-surfaced flooring structures. Nevertheless, these wear layers, and in particular polyurethane wear layers, also have certain drawbacks. For example, they are susceptible to staining; thus, when exposed to common household items likely to cause stains (for example ballpoint pen, lipstick, mustard, and shoe polish), polyurethane coatings tend to be more easily stained than vinyl coatings. 20

In recent years, the coatings industry has expended considerable effort to develop new and different types of melamine-formaldehyde resins, often referred to as aminoplasts. Such materials are melamines (triamino- 25 triazines) which have been N-alkylated with formaldehyde to provide a methylolated or partially methylolated melamine. The methylol groups are then etherified or partially etherified to provide a crosslinkable material. Such materials have found wide use in coatings for automobiles, appliances and other fairly rigid types of surfaces, and they have also been used in coatings for certain flexible substrates including, for example paper, paperboard, metal foils, and cellulose films, (cellophanes). However, such materials have never been 30 successfully applied to flooring structures, and in particular to vinyl flooring structures or to vinyl flooring structures comprising polyurethane wear layers. 30

One objective of the present invention is to provide resilient surface coverings with protective coatings, which may for example be 0.2 or more mils (0.025 mm or more) thick which will deform in conjunction with the surface coverings, yet will provide improved scratch and stain resistance.

35 Another objective of the present invention is to provide surface covering, especially flooring, structures comprising composite wear surfaces whereby the wear layer material is provided with an improved scratch and stain-resistant character. 35

These and other advantages of the present invention will become apparent from the detailed description of preferred embodiments which follows.

40 The present invention relates to surface coverings, and in particular to floor coverings, which comprise treated polyurethane or other wear layers. A coating comprising a melamine aminoplast which preferably is at least partially etherified with alkyl groups comprising 1, advantageously 4, to 10 carbon atoms, a vinyl modifier resin (the presence of this component being preferred but not essential), a polyol, and a suitable, advantageously an acid, catalyst is formed, advantageously on a release surface, and thermally cured. A 45 crosslinkable wear layer composition is then applied, as by casting, on the cured layer and crosslinked, and the composite is transferred to a support surface. Surface coverings are produced which exhibit surprising resistance to common household stains, and also improved scratch resistance. 45

In one embodiment, the present invention provides a resilient surface covering, said covering comprising a resilient support and a crosslinked wear layer adhered thereto, the upper surface of said wear layer comprising 50 a protective coating derived from a composition comprising (1) a melamine aminoplast which is alkyl etherified with alkyl groups comprising 1 to 10 carbon atoms, (2) a vinyl modifier resin, (3) a polyol, and (4) a suitable catalyst, said protective coating having the ability to conform to the deflections of said wear layer, yet having improved scratch and stain resistance relative to the untreated wear layer. 50

In the second embodiment, the present invention provides a process for providing a wear surface for a 55 resilient surface covering, said process comprising the steps of providing a release carrier comprising a support surface and a release coating; disposing on said release coating a composition comprising (1) a melamine aminoplast which is alkyl etherified with alkyl groups comprising 1 to 10 carbon atoms, (2) a vinyl modifier resin, (3) a polyol, and (4) a suitable catalyst; at least partially thermally curing said composition; disposing a crosslinkable wear layer composition on said aminoplast layer; curing said wear layer; laminat- 60 ing said cured wear layer to a resilient support structure; and separating said release carrier from said wear layer, whereby said surface covering comprises a wear layer having a protective coating, said protective coating being flexible, and scratch and stain-resistant relative to the untreated wear layer. 60

In a third embodiment, the present invention provides a resilient surface covering comprising a wear layer, the wear layer having a free surface comprising a protective coating derivable from a composition comprising 65 ing 65

- (a) a melamine aminoplast alkyl etherified with alkyl groups having from 1 to 10 carbon atoms,
- (b) a vinyl modifier resin,
- (c) a polyol, and
- (d) a catalyst.

5 In a fourth embodiment, the present invention provides a process for forming a resilient surface covering comprising a wear layer, which comprises applying to a free surface of the wear layer a composition comprising

- (a) a melamine aminoplast alkyl etherified with alkyl groups having from 1 to 10 carbon atoms,
- (b) a vinyl modifier resin,
- 10 (c) a polyol, and
- (d) a catalyst, and forming a protective coating therefrom, or by applying a protective coating derivable from such a composition.

Advantageously, the coating is derived from the specified composition. Advantageously, the composition is cured to form the coating, preferably by thermal curing.

15 In further, presently not preferred, embodiments, the vinyl modifier resin is omitted.

The resilient surface coverings which may be prepared according to the present invention may, apart from the protective layer, be of any type, many being presently well-known in the art. Thus, they may comprise an underlying resilient support typical of those used to prepre vinyl flooring structures. Supports of this type may be derived, for example, from backing materials, plastisols, foamed plastisols, randomly dispersed vinyl particles, and stencil disposed vinyl particles, the selection of such materials being well within the skill of an ordinary artisan.

The major portion of the wear layer will comprise any suitable material many of which are presently well known in the art. Examples of such materials are crosslinked wear layers derived from, for example, urethanes, acrylated or methacrylated urethanes, or unsaturated polyesters, all of which are well known in the art. These wear layers are desirably crosslinkable, as by moisture-curing techniques, thermally induced free radical curing techniques, oxidative curing techniques, radiation-curing techniques, or a combination thereof.

The novelty of the present invention resides primarily in the presence of a second protective layer on the underlying wear layer component. This second material is derived from melamine-formaldehyde derivatives, a polyol, an acid catalyst and a vinyl modifier resin, and provides a flexible, yet scratch and stain-resistant, upper surface.

The melamine-formaldehyde resins which may be used to practice the present invention are referred to herein as "melamine aminoplasts". These materials may be partially or substantially methylolated, and the methylol groups may be partially or substantially etherified with methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, and decyl groups, isomers of these moieties, and mixtures thereof; however, the aminoplast preferably will be at least partially etherified with a relatively long chain alkyl group having from about 4 to about 10 carbon atoms. These long-chain portions of the aminoplast assist in providing flexibility to the cured vinyl product. Many of these aminoplasts are commercially available and are sold, for example, as cross-linking agents by American Cyanamid Company under the trade mark "Cymel" and as resins by Monsanto Company under the trade mark "Resimene".

The resin which in the preferred embodiments will be utilized as a modifier will be a vinyl resin or a combination of vinyl resins, many of which are well-known in the art. Examples of such resins are copolymer solution vinyl resins derived from vinyl chloride and vinyl acetate. Resins of this type are sold by Union Carbide under the trade mark VAGH, and they may or may not contain hydroxyl or other functionality. Examples of other resins are specialty resins such for example as the polyvinyl acetals (e.g., polyvinylbutyral), either alone or in combination with polyvinyl alcohol and/or polyvinyl acetate, and polyvinyl esters such for example as polyvinyl acetate. Such materials are preferred and are well-known in the art as being amenable to application from solution; thus, they are distinguishable from dispersion grade and general purpose resins which are essentially insoluble in most conventional solvents. In essence, the modifier resins should be suitable to enhance the flexibility and strength of the cured composition without adversely effecting the stain resistance.

The polyols which may be used to practice the present invention are alcohols which comprise two or more alcohol groups. For example, 1, 6-hexanediol, 1, 4-cyclohexane dimethanol, glycerine, neopentyl glycol, tripropylene glycol, 1, 4-butanediol, trimethylolpropane, pentaerythritol, and many other polyols may be utilized to practice the present invention, many said polyols being well-known in the art.

The catalysts which may be used to catalyze the thermal curing reaction between the vinyl modifier resin, the melamine aminoplast, the polyol if present and the wear layer surface are generally acid catalysts, many of which are also well-known in the art. Examples of such catalysts are sulfonic acids, such for example as methanesulfonic acid and p-toluenesulfonic acid, and other acids such for example as citric acid, maleic acid, and phthalic acid. The catalysts may be used in the free acid form, but they may also be stabilized, such for example as by the use of ammonia or an amine to neutralize the acid. Examples of such amines are diisopropanolamine and 2-amino-2-methyl-1-propanol. The catalyst should be compatible with the other components of the system. Because many of these catalysts are well-known by those skilled in the art, selection will be within the capability of an ordinary artisan.

To practice the preferred process according to the present invention, a release surface is provided for the aminoplast composition. For a very smooth surface, a polished chrome plate or a release paper coated with a

polyalkylene material may be used, a particularly good example of the latter being polypropylene. For less gloss surfaces, other types of coated papers or belts may be used, examples of which are silicone-, complexed chromium- and methyl cellulose-treated papers or belts. The selection of such materials is well within the skill of an ordinary artisan.

- 5     Onto the release paper is cast a layer of aminoplast composition. Although the component ratios of the composition will have substantial variability, the composition will usually comprise, by weight, from 4 to 1 parts of the modifier resin for 1 to 4 parts of the aminoplast/polyol mixture. Further, the aminoplast/polyol mixture may comprise from 5 to 1 parts of aminoplast for 1 to 5 parts of polyol. Preferably, however, there will be from 3.5 to 1 parts of modifier for every 1 to 2 parts of aminoplast/polyol which in turn preferably has a ratio of from 3 to 1 parts of the aminoplast for every 1 to 3 parts of polyol. Usually this composition will be provided in an organic solvent; however, it is also possible to apply the composition in aqueous form.

- 10    After the aminoplast composition is applied to the release paper, it is dried and at least partially cured at about 250°F (about 120°C). Although it is possible to form the laminates of the present invention using partially cured aminoplast layers, to obtain a high quality product it is usually preferable to ensure that the aminoplast layer is fully cured prior to the deposition of the remainder of the wear layer, e.g., the urethane layer.

- 15    The crosslinkable wear layer coating composition may be disposed directly on the aminoplast layer after the aminoplast layer is cured. It is noted, however, that the artisan may optionally elect to pretreat the surface of the cured aminoplast layer by corona discharge or by applying a key coat composition so as to promote adhesion between the layers. The latter compositions, which typically are vinyl lacquers, are in wide use and are well-known to those skilled in the art. Such compositions often comprise vinyl chloride copolymer solution resins such as the VAGH resin described above.

- 20    Corona discharge is also well-known in the art and involves a raising of the surface energy by exposing the surface to an electrical arc. The amount of energy necessary to promote good adhesion may be readily determined by standard means. Thus, the surface tension of the coating composition may be determined according to ASTM D 1331 and the surface energy of the surface to be coated may be determined essentially as described in ASTM D 2578. The objective is to raise the surface energy of the surface to be coated such that it will be wetted by the coating composition. Ideally the surface energy resulting from the corona treatment will be at least about 10 dynes/cm greater than the surface tension of the coating composition.

- 25    The thickness of application of the wear layer composition may vary from 1 to 8 mils (about 0.025 to 0.20 mm), but preferably will vary from 2.5 to 4.5 mils (about 0.06 to 0.11 mm). The composition may be a low solids (e.g. 40%) solution of a polyether or polyester-based urethane which is moisture curable, or it may comprise a two component system such for example as a polyester comprising hydroxyl functionality combined with a diisocyanate. Curing of the latter composition occurs by reaction of the diisocyanate with the hydroxyl groups of the polyester, as well as with moisture in the air. Alternatively, radiation curable, or combined radiation and moisture curable, components may be utilized. As with the aminoplast layers, it is also advisable to ensure that the urethane layer is fully cured before lamination to the resilient surface covering is achieved.

- 30    The thickness of application of the wear layer composition may vary from 1 to 8 mils (about 0.025 to 0.20 mm), but preferably will vary from 2.5 to 4.5 mils (about 0.06 to 0.11 mm). The composition may be a low solids (e.g. 40%) solution of a polyether or polyester-based urethane which is moisture curable, or it may comprise a two component system such for example as a polyester comprising hydroxyl functionality combined with a diisocyanate. Curing of the latter composition occurs by reaction of the diisocyanate with the hydroxyl groups of the polyester, as well as with moisture in the air. Alternatively, radiation curable, or combined radiation and moisture curable, components may be utilized. As with the aminoplast layers, it is also advisable to ensure that the urethane layer is fully cured before lamination to the resilient surface covering is achieved.

- 35    When fully cured materials are prepared and then laminated to resilient surface coverings, occasional poor adherence of the laminate to the surface covering has been encountered. As with the aminoplast layer and wear layer, it has been found desirable to avoid delamination problems by providing a key coat between the back (exposed) surface of the wear layer and the resilient layer with which it is interfaced. As an alternative, corona discharge treatment is also available to facilitate adhesion of the coats.

- 40    The upward facing wear layer is interfaced with the resilient support surface layer, with or without an intervening key coat or corona discharge treatment, and the composite material is subjected to heat and pressure to ensure firm adhesion. The composite material may also be affixed to granular or consolidated stencil vinyl products in the same manner. After consolidation is complete, the release paper is stripped from the hot sample to provide a decorative surface covering which exhibits good scratch and stain resistance. Thus, the materials are resistant to staining by household items such as lipstick, mustard, shoe polish, food dye and the like.

50    The present invention will be better understood by reference to the examples which follow, said examples being provided by way of illustration and not limitation.

## EXAMPLES

## Example 1

The following compositions are prepared comprising each of the indicated components in parts by weight:

5	Component	Sample No.					5
		1-1	1-2	1-3	1-4	1-5	
	Xylol	31.0	31.2	31.2	22.9	31.3	
10	Vinyl chloride/vinyl acetate copolymer (VAGH) from Union Carbide	---	13.6	13.6	13.6	19.3	10
	UV stabilizer (Uvitex OB; 1% in xylol)	1.0	1.0	1.0	1.0	1.0	
15	Organotin stabilizer (Thermolite 31 from Metal and Thermit Co.)	---	0.25	0.25	0.25	0.35	15
	Fluorocarbon surfactant (FC-430 from 3-M Company; 10% in xylol)	1.0	0.8	0.8	0.76	0.8	
20	Methyl isobutyl ketone	35.0	40.10	38.40	34.00*	55.50	20
	Diacetone	8.0	8.0	8.0	14.0	8.0	
	Isopropyl alcohol	3.6	3.6	3.6	---	3.5	
	Aminoplast resin (Resimene 755)						
25	from Monsanto)	15.3	5.1	---	20.4	4.13	25
	Cyclohexane dimethanol (90% in water)	5.1	1.7	---	6.8	1.38	
	Aminoplast resin (Cymel 301 from American						
30	cyanamid	---	---	5.1	---	---	30
	1,6-Hexanediol	---	---	1.7	---	---	
	p-Toluenesulfonic acid (25% in 1:1 xylol/ isopropyl alcohol)	2.9	0.9	0.9	3.8	0.8	
35	Viscosity, No. 2 Zahn cup (seconds)	15	23	30	30	35	35
	Total Solids (%)	20.6	19.7	19.8	35.9	20.3	
	Weight ratio of vinyl copolymer to total						
40	melamine plus diol	---	2:1	2:1	1:2	3.5:1	40

\* Methyl ethyl ketone may be substituted for methyl isobutyl ketone

Each of a series of polypropylene-coated release papers is provided with a coating of one of the above compositions at a wet thickness of about 2.5 to 3.5 mils (0.06 to 0.09 mm) using a reverse roll coater. The coated paper is then passed through a 250°F (about 120°C) oven such that the coating resides in the oven for 4 minutes.

A moisture-curable polyurethane coating composition is prepared for application to the coated release papers. The components are as follows:

50	Component	Weight (Grams)	50
	Polyetherdiol (Union Carbide LHT 240)	40.80	
	Polyetherdiol (Union Carbide LHT 112)	14.20	
	Xylene solvent	110.00	
	Toluene solvent	46.00	
55	Dimethyltin dineodecanoate catalyst (Witco UL-28)	0.55	55
	Surfactant (Monsanto XA-677 Multiflow)	0.30	
	Light stabilizer (American Cyanamid UV-5411)	0.20	

60 These components are charged to a stirred, nitrogen-purged glass reactor and heated to 70°C for one hour. A 44.90-gram quantity of 4, 4'-diisocyanato dicyclohexylmethane is added dropwise over a 30-minute period at a rate sufficient to maintain the temperature of the mixture at 70°C. After an additional two-hour period of stirring and heating at 70°C, the product is cooled.

65 To each of the release papers is applied a 1 to 2.5-mil (0.025 to 0.06 mm) wet layer of key coat lacquer

comprising 18.54 percent by weight of VAGH resin, 0.37 percent Thermolite 31, 0.0094 percent Uvitex OB and 81.08 percent methyl isobutyl ketone solvent. The coated sample is then dried in ambient air or under low heat to remove the solvent. Upon completion of the drying step, each paper is provided with a 5.0- to 6.5-mil (0.13 to 0.165 mm) wet coating of the moisture curable polyurethane material described above. The coated samples are then passed through the 250°F oven to dry the sample completely, the dwell time in the oven being 7 minutes.

In the lamination and consolidation steps, a 12 inch x 12 inch (30 x 30 cm) press is used to prepare 9 inch x 9 inch (23 x 23 cm) samples. The top platen of the press is heated to 310°F (about 155°C) whereas the bottom platen is heated to 300°F (about 150°C). The dwell time in the press is 10 seconds at 250 pounds (1.72 MPa) pressure, followed by 10 seconds at 1200 pounds (8.27 MPa) pressure. Following removal of the sample from the press, the release paper is stripped from the hot sample.

Both stencil vinyl and gelled vinyl plastisol resilient support materials may be used for lamination with the above coatings, and stain resistance is evaluated using ordinary household stains. All samples show superior stain resistance as compared to the untreated polyurethane material, and also show good scratch resistance.

#### Example 2

Two coating compositins having the compositions set forth for sample 1-2 and 1-4 are prepared and each coating is applied to a polypropylene surface release paper using a forward roll coater. Each release paper is passed twice through the coater in order to obtain a total dry film thickness of 0.25 mils (0.006 mm). Curing is obtained by passing the coated sheets through a 250-260°F (120-126°C) oven at a dwell time of 1.5 minutes for each coating. Two rolls of paper are prepared, each being provided with one of the two coatings.

Each of the rolls is treated such that one-half of each is coated with the vinyl key coat composition described in Example 1 and the other half is treated with corona discharge. The key coated portions of the roll are provided as described in Example 1, the drying of the coating being accomplished in an oven at a dwell time of less than one minute. The corona discharge exposure for the remaining portions of the rolls is 9.1 watts/square foot/minute (98 watts/sq. m/minute) such that the surface energy is about 55 dynes/cm.

Following the application of the key coat and the corona treatment, all rolls are coated with a 3.2-mil (0.08 mm) wet thickness of the polyurethane coating described in Example 1 and the coating is cured as described in that example. The entire surface of each roll is then provided with a vinyl key coat as described above and the coated material is interfaced with a granular stencil vinyl mix. Consolidation is achieved as described in Example 1. The resulting products demonstrate good stain and scratch resistance and the coating is firmly adhered to the substrate.

#### Example 3

Coating compositions are prepared having the following components.

Component	Sample No.				
	3-1	3-2	3-3	3-4	3-5
Toluene	28.10	28.10	28.10	23.60	29.05
40 Butyl acetate	42.14	42.14	42.14	34.98	43.54
Isopropyl alcohol	6.32	6.32	6.32	5.34	6.56
Organotin stabilizer (Thermolite 31)	0.21	0.21	0.21	0.21	0.27
45 Vinyl chloride/vinyl acetate copolymer (VAGH)	14.46	14.46	14.46	11.15	14.74
UV stabilizer (Uvitex OB)	1.06	1.06	1.06	1.67	1.12
50 Fluorocarbon surfactant (FC-430)	0.50	0.50	0.50	0.77	0.53
Aminoplast resin Resimeme 755	5.40	---	---	16.72	3.16
Cymel 1130	---	---	5.40	---	---
Cymel 1133	---	5.40	---	---	---
55 Cyclohexane dimethanol (90% in water)	1.81	1.81	1.81	5.57	1.05
p-Toluenesulfonic acid (25% in 1:1 xylol/isopropyl alcohol)	0.25	0.25	0.25	0.78	0.15
60 Total Solids (%)	21.67	21.67	21.67	33.44	19.20
Weight ratio of vinyl copolymer to total melamine plus diol	2:1	2:1	2:1	1:2	3.5:1

65 Three sets of samples are prepared following the procedure of Example 1, but using each of the above five

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coatings. One set of samples is provided wherein the cured coating on the release paper is corona treated prior to coating with the polyurethane layer of Example 1; a second structure is provided wherein a key coat of Example 1 is used between the cured coating on the release paper and the polyurethane layer; and a third set of samples is prepared wherein neither a key coat nor a corona treatment is used between the melamine-containing layer and the polyurethane layer. In all cases, excellent stain resistance is noted and, in essentially all instances, firm adhesion of the melamine-containing layer to the polyurethane layer is obtained.

#### CLAIMS

1. A resilient surface covering, said covering comprising a resilient support and a crosslinked wear layer adhered thereto, the upper surface of said wear layer comprising a protective coating derived from a composition comprising
  - (a) a melamine aminoplast which is alkyl etherified with alkyl groups comprising 1 to 10 carbon atoms,
  - (b) a vinyl modifier resin,
  - (c) a polyol, and
  - (d) a suitable catalyst,
 said protective coating having the ability to conform to the deflections of said wear layer, yet having improved scratch and stain resistance relative to the untreated wear layer.
2. A surface covering as set forth in claim 1 wherein said wear layer is derived from materials selected from the group consisting of urethane, acrylated urethanes, methacrylated urethanes and unsaturated polyesters.
3. The surface covering as set forth in claim 1 or claim 2 wherein said vinyl modifier resin is a solution vinyl copolymer resin.
4. The surface covering as set forth in claim 3 wherein said resin is derived from vinyl chloride and vinyl acetate.
5. The surface covering as set forth in claim 1 or claim 2 wherein said modifier resin is selected from a polyvinyl acetal, a polyvinyl ester and a combination of a polyvinyl acetal with polyvinyl alcohol or with a polyvinyl ester.
6. The surface covering as set forth in any one of claims 1 to 5 wherein said melamine aminoplast is at least partially alkyl etherified with alkyl groups comprising from 4 to 10 carbon atoms.
7. The surface covering as set forth in any one of claims 1 to 6 wherein said composition comprised, by weight, from 4 to 1 part of modifier resin for every 1 to 4 parts of aminoplast/polyol mixture, said mixture comprising from 5 to 1 parts of aminoplast for every 1 to 5 parts of polyol.
8. The surface covering as set forth in any one of claims 1 to 7 wherein said composition comprised, by weight, from 3.5 to 1 part of modifier resin for every 1 to 2 parts of aminoplast/polyol mixture, said mixture comprising from 3 to 1 parts of aminoplast for every 1 to 3 parts of polyol.
9. The surface covering as set forth in any one of claims 1 to 8 wherein adhesion between said wear layer and said aminoplast layer is facilitated by a key coat layer.
10. The surface covering as set forth in any one of claims 1 to 8 wherein adhesion between said wear layer and said aminoplast layer is facilitated by corona discharge pretreatment of said aminoplast layer.
11. A resilient surface covering comprising a wear layer, the wear layer having a free surface comprising a protective coating derivable from a composition comprising
  - (a) a melamine aminoplast alkyl etherified with alkyl groups having from 1 to 10 carbon atoms,
  - (b) a vinyl modifier resin,
  - (c) a polyol, and
  - (d) a catalyst.
12. A resilient surface covering, substantially as described in Example 1 with reference to any one of Samples 1-1 to 1-5, or in Example 2, or in Example 3 with reference to any one of Samples 3-1 to 3-5.
13. A process for providing a wear surface for a resilient surface covering, said process comprising the steps of
  - providing a release carrier comprising a support surface and a release coating,
  - disposing on said release coating a composition comprising
    - (a) a melamine aminoplast which is alkyl etherified with alkyl groups comprising 1 to 10 carbon atoms,
    - (b) a vinyl modifier resin,
    - (c) a polyol, and
    - (d) a suitable catalyst,
  - at least partially thermally curing and composition,
  - disposing a crosslinkable wear layer composition on said aminoplast layer,
  - curing said wear layer,
  - laminating said cured wear layer to a resilient support structure, and
  - separating said release carrier from said wear layer, whereby said surface covering comprises a wear layer having a protective coating, said protective coating being flexible, and scratch and stain-resistant relative to the untreated wear layer.
14. The process as set forth in claim 13 wherein said wear layer is derived from material selected from the group consisting of urethanes, acrylated urethanes, methacrylated urethanes and unsaturated polyesters.

15. The process as set forth in claim 13 or claim 14 wherein said vinyl modifier resin is a solution vinyl copolymer resin.
16. The process as set forth in claim 15 wherein said resin is derived from vinyl chloride and vinyl acetate.
17. The process as set forth in claim 13 or claim 14 wherein said modifier resin is selected from a polyvinyl acetal, a polyvinyl ester and a combination of a polyvinyl acetal with polyvinyl alcohol or with a polyvinyl ester. 5
18. The process as set forth in any one of claims 13 to 17 wherein said melamine aminoplast is at least partially alkyl etherified with alkyl groups comprising 4 to 10 carbon atoms.
19. The process as set forth in any one of claims 13 to 18 wherein said composition comprises, by weight, from 4 to 1 part of modifier resin for every 1 to 4 parts of aminoplast/polyol mixture, said mixture comprising from 5 to 1 part of aminoplast for every 1 to 5 parts of polyol. 10
20. The process as set forth in claim 19 wherein said composition comprises, by weight, from 5 to 1 part of modifier resin for every 1 to 2 parts of aminoplast/polyol mixture, said mixture comprising from 3 to 1 part of aminoplast for every 1 to 3 parts of polyol.
21. The process as set forth in any one of claims 13 to 20 wherein a key coat is provided between said wear layer and said aminoplast layer. 15
22. The process as set forth in any one of claims 13 to 20 wherein said melamine aminoplast layer is subjected to corona discharge before said wear layer is disposed on said aminoplast layer.
23. The process as set forth in any one of claims 13 to 22 wherein said melamine aminoplast is fully cured before said wear layer composition is disposed thereon. 20
24. A process for forming a resilient surface covering comprising a wear layer, which comprises applying to a free surface of the wear layer a composition comprising
  - (a) a melamine aminoplast alkyl etherified with alkyl groups having from 1 to 10 carbon atoms,
  - (b) a vinyl modifier resin,
  - (c) a polyol, and 25
  - (d) a catalyst. 25
25. A process for the manufacture of a surface covering material, carried out substantially as described in Example 1 with reference to any one of Samples 1-1 to 1-5, or in Example 2, or in Example 3 with reference to any one of Samples 3-1 to 3-5.
26. A resilient surface covering, said covering comprising a resilient support and a crosslinked wear layer adhered thereto, the upper surface of said wear layer comprising a protective coating derived from a composition comprising
  - (a) a melamine aminoplast which is alkyl etherified with alkyl groups comprising 1 to 10 carbon atoms,
  - (b) a polyol, and
  - (c) a suitable catalyst. 35
27. A resilient surface covering comprising a wear layer, the wear layer having a free surface comprising a protective coating derivable from a composition comprising
  - (a) a melamine aminoplast alkyl etherified with alkyl groups having from 1 to 10 carbon atoms,
  - (b) a polyol, and
  - (c) a catalyst. 40
28. A process for providing a wear surface for a resilient surface covering, said process comprising the steps of
  - providing a release carrier comprising a support surface and a release coating,
  - disposing on said release coating a composition comprising
    - (a) a melamine aminoplast which is alkyl etherified with alkyl groups comprising 1 to 10 carbon atoms,
    - (b) a polyol, and
    - (c) a suitable catalyst, 45
  - at least partially thermally curing said composition,
  - disposing a crosslinkable wear layer composition on said aminoplast layer,
  - curing said wear layer, 50
  - laminating said cured wear layer to a resilient support structure, and
  - separating said release carrier from said wear layer.
29. A process for forming a resilient surface covering comprising a wear layer, which comprises applying to free surface of the wear layer a composition comprising
  - (a) a melamine aminoplast alkyl etherified with alkyl groups having from 1 to 10 carbon atoms,
  - (b) a vinyl modifier resin,
  - (c) a polyol, and
  - (d) a catalyst. 55
30. Any new feature hereinbefore described, or any new combination of hereinbefore described features.